United States Patent [19]

Freeman

[54] **DYNAMIC AND STATIC HAND GESTURE RECOGNITION THROUGH LOW-LEVEL IMAGE ANALYSIS**

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[52] **U.S. Cl.** **382/168**; 382/170; 345/122; 395/199; 395/155

[58] **Field of Search** 382/18, 1, 16, 382/51; 358/105, 125, 126; 348/169, 214, 578, 700; 395/152, 155, 119, 161, 100; 345/122, 158

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[57] **ABSTRACT**

A low-level model-free dynamic and static hand gesture recognition system utilizes either a 1-D histogram of frequency of occurrence vs. spatial orientation angle for static gestures or a 2-D histogram of frequency of occurrence vs. space-time orientation for dynamic gestures. In each case the histogram constitutes the signature of the gesture which is used for gesture recognition. For moving gesture detection, a 3-D space-time orientation map is merged or converted into the 2-D space-time orientation histogram which graphs frequency of occurrence vs. both orientation and movement. It is against this representation or template that an incoming moving gesture is matched.

7 Claims, 7 Drawing Sheets